

WHAT IS CLAIMED IS:

1. A method for amplifying diversity transmit signals, comprising:  
receiving a transmit signal at a vector modulator, the vector modulator  
operable to process the transmit signal to yield a plurality of diversity transmit  
5 signals;  
amplifying each of the plurality of diversity transmit signals according to a  
gain using at least one power amplifier; and  
transmitting the plurality of amplified diversity transmit signals at a plurality  
of antennas.  
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2. The method of Claim 1, further comprising passing each of the  
plurality of amplified diversity transmit signals through one or more loads, each load  
having a load impedance matching an antenna impedance corresponding to an  
antenna of the plurality of antennas.  
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3. The method of Claim 1, wherein the vector modulator and the at least  
one power amplifier are located at a common substrate.
4. The method of Claim 1, wherein processing the transmit signal to yield  
20 the plurality of diversity transmit signals comprises:  
splitting the transmit signal to yield at least two transmit signals;  
adjusting a phase of at least one of the at least two transmit signals;  
adjusting the amplitude of at least one of the at least two transmit signals; and  
generating the plurality of diversity transmit signals according to the adjusted  
25 transmit signals.

5. A method for amplifying diversity transmit signals, comprising:  
receiving two or more transmit signals and a control signal, the control signal comprising a gain path selection;

5 selecting for each transmit signal at least one gain path from a plurality of gain paths according to the gain path selection of the control signal, each gain path of the plurality of gain paths associated with at least one gain of a plurality of gains;

amplifying the two or more transmit signals according to the at least one gain of the plurality of gains; and

10 transmitting the two or more amplified transmit signals using a plurality of antennas.

6. The method of Claim 5, further comprising passing each of the two or more amplified diversity transmit signals through one or more loads, each load having a load impedance matching an antenna impedance corresponding to an antenna of the plurality of antennas.

7. The method of Claim 5, wherein the control signal comprises an internal control signal.

20 8. The method of Claim 5, wherein the control signal comprises an external control signal.

9. The method of Claim 5, wherein:  
each gain path of the plurality of gain paths comprises one or more power amplifiers, the one or more power amplifiers collectively yielding the at least one gain of the plurality of gains; and

the at least one gain comprises a gain in a range of 5 dB to 15 dB.

10. The method of Claim 5, wherein:

each gain path of the plurality of gain paths comprises one or more power amplifiers, the one or more power amplifiers collectively yielding the at least one gain of the plurality of gains; and

5 the at least one gain comprises a gain in a range of 23 dB to 31 dB.

11. The method of Claim 5, wherein:

each gain path of the plurality of gain paths comprises one or more power amplifiers, the one or more power amplifiers collectively yielding the at least one gain of the plurality of gains; and

10 the at least one gain comprises a high gain and a low gain, the high gain having 25 dB, the low gain having 12 dB.

12. The method of Claim 5, wherein:

15 each gain path comprises one or more amplification stages of a plurality of amplification stages, the one or more amplification stages operable to yield the associated gain;

the plurality of gain paths comprises a first gain path and a second gain path;

the plurality of amplification stages comprises a first plurality of amplification stages and a second plurality of amplification stages;

20 the first gain path is associated with the first plurality of amplification stages and the second gain path is associated with the second plurality of amplification stages; and

25 the first plurality of amplification stages is substantially different from the second plurality of amplification stages.

13. The method of Claim 5, wherein selecting at least one gain path for each transmit signal from a plurality of gain paths according to the gain path selection of the control signal further comprises:

5       selecting a first gain path for a first transmit signal according to the control signal; and  
          selecting a second transmit signal according to the control signal.

14. The method of Claim 13, wherein the selection of the first gain path is performed substantially simultaneously with the selection of the second gain path.

15. A system for amplifying diversity transmit signals, comprising:  
a vector modulator operable to:  
receive a transmit signal; and  
process the transmit signal to yield a plurality of diversity transmit  
5 signals;  
at least one power amplifier coupled to the vector modulator and operable to  
amplify each of the plurality of diversity transmit signals according to a gain; and  
a plurality of antennas for transmitting the plurality of amplified diversity  
transmit signals.

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16. The system of Claim 15, further comprising one or more loads for  
passing through each of the plurality of amplified diversity transmit signals, each load  
having a load impedance matching an antenna impedance corresponding to an  
antenna of the plurality of antennas.

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17. The system of Claim 15, wherein the vector modulator and the at least  
one power amplifier are located at a common substrate.

18. The system of Claim 16, wherein the vector modulator, the at least one  
20 power amplifier, and the one or more loads are located at a common substrate.

19. The system of Claim 15, the vector modulator further operable to  
process the transmit signal to yield the plurality of diversity transmit signals by:  
splitting the transmit signal to yield at least two transmit signals;  
25 adjusting a phase of at least one of the at least two transmit signals;  
adjusting the amplitude of at least one of the at least two transmit signals; and  
generating the plurality of diversity transmit signals according to the adjusted  
transmit signals.

20. A system for amplifying diversity transmit signals, comprising:  
a power amplifier module operable to:  
receive two or more transmit signals and a control signal, the control  
signal comprising a gain path selection;  
5 select for each transmit signal at least one gain path from a plurality of  
gain paths according to the gain path selection of the control signal, each gain path of  
the plurality of gain paths associated with at least one gain of a plurality of gains; and  
amplify the two or more transmit signals according to the at least one  
gain of the plurality of gains; and  
10 a plurality of antennas for transmitting the two or more amplified transmit  
signals.

21. The system of Claim 20, further comprising one or more loads for  
passing through each of the two or more amplified diversity transmit signal, each load  
15 having a load impedance matching an antenna impedance corresponding to an  
antenna of the plurality of antennas.

22. The system of Claim 20, wherein the control signal comprises an  
internal control signal.

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23. The system of Claim 20, wherein the control signal comprises an  
external control signal.

24. The system of Claim 20, wherein:  
25 each gain path of the plurality of gain paths comprises one or more power  
amplifiers, the one or more power amplifiers collectively yielding the at least one gain  
of the plurality of gains; and

the at least one gain comprises a gain in a range of 5 dB to 15 dB.

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25. The system of Claim 20, wherein:

each gain path of the plurality of gain paths comprises one or more power amplifiers, the one or more power amplifiers collectively yielding the at least one gain of the plurality of gains; and

5 the at least one gain comprises a gain in a range of 23 dB to 31 dB.

26. The system of Claim 20, wherein:

each gain path of the plurality of gain paths comprises one or more power amplifiers, the one or more power amplifiers collectively yielding the at least one gain of the plurality of gains; and

10 the at least one gain comprises a high gain and a low gain, the high gain having 25 dB, the low gain having 12 dB.

27. The system of Claim 20, wherein:

15 each gain path comprises one or more amplification stages of a plurality of amplification stages, the one or more amplification stages operable to yield the associated gain;

the plurality of gain paths comprises a first gain path and a second gain path;

the plurality of amplification stages comprises a first plurality of amplification stages and a second plurality of amplification stages;

20 the first gain path is associated with the first plurality of amplification stages and the second gain path is associated with the second plurality of amplification stages; and

25 the first plurality of amplification stages is substantially different from the second plurality of amplification stages.

28. The system of Claim 20, the power amplifier further comprising a first switch and a second switch, the first switch operable to select a first gain path for a first transmit signal according to the control signal, the second switch operable to select a second transmit signal according to the control signal.

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29. The system of Claim 28, wherein the first switch and the second switch select the first gain path and second gain path substantially simultaneously.



30. A system for amplifying diversity transmit signals, comprising:

means for receiving a transmit signal at a vector modulator, the vector modulator operable to process the transmit signal to yield a plurality of diversity transmit signals;

5 means for amplifying each of the plurality of diversity transmit signals according to a gain using at least one power amplifier; and

means for transmitting the plurality of amplified diversity transmit signals at a plurality of antennas.

31. A system for amplifying diversity transmit signals, comprising:
- means for receiving two or more transmit signals and a control signal, the control signal comprising a gain path selection;
  - means for selecting at least one gain path from a plurality of gain paths according to the gain path selection of the control signal, each gain path of the plurality of gain paths associated with at least one gain of a plurality of gains;
  - means for amplifying the two or more transmit signals according to the at least one gain of the plurality of gains; and
  - means for transmitting the two or more amplified transmit signals using a plurality of antennas.

32. A system for amplifying diversity transmit signals, comprising:  
a power amplifier module operable to:

5 receive two or more transmit signals and a control signal, the control  
signal comprising a gain path selection and one of a received internal control signal or  
an external control signal;

10 select for each transmit signal at least one gain path from a plurality of  
gain paths according to the gain path selection of the control signal, each gain path of  
the plurality of gain paths associated with at least one gain of a plurality of gains and  
comprising one or more power amplifiers, the one or more power amplifiers  
collectively yielding the at least one gain of the plurality of gains; and

amplify the two or more transmit signals according to the at least one  
gain of the plurality of gains, the at least one gain comprising a high gain and a low  
gain, the high gain having 25 dB, the low gain having 12 dB;

15 a plurality of antennas for transmitting the two or more amplified transmit  
signals; and

one or more loads for passing through each of the two or more amplified  
diversity transmit signal, each load having a load impedance matching an antenna  
impedance corresponding to an antenna of the plurality of antennas.